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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/723,319

11/25/2003

Anthony John Dean

130759-1

9460

6147

7590

07/12/2006

GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH  
PATENT DOCKET RM. BLDG. K1-4A59  
NISKAYUNA, NY 12309

EXAMINER

KIM, TAE JUN

ART UNIT

PAPER NUMBER

3746

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/723,319	Applicant(s) DEAN ET AL.	
	Examiner Ted Kim	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 5/15/06.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/15/2006 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussing (6,062,018) as applied above, and further in view of either the Cooper et al paper of the IDS or the Russian 2034996C abstract and optionally further in view of Titus et al (5,847,353). Bussing teaches a power system comprising (see e.g. Fig. 10): a fuel preconditioner 472 (predetonator, see col. 12, lines 55+) adapted to convert a fuel to at least one conditioned fuel; a pulse detonation combustor 104 adapted to receive the conditioned fuel and a primary oxidizer and to detonate a mixture comprising the

conditioned fuel and the primary oxidizer and exhaust a plurality of detonation products; and a turbine positioned downstream from said pulse detonation combustor, said turbine being in flow communication with said pulse detonation combustor; a compressor 2 (Fig. 1) configured to supply air to at least one of said fuel preconditioner 472, said pulse detonation combustor 100, and said turbine 4; the fuel comprises a hydrocarbon fuel; the fuel is selected from the group consisting of natural gas and distillate liquids fuels (see e.g. col. 2, lines 30+; col. 8, lines 12+); said pulse detonation combustor is further adapted to receive a primary fuel from 470 and to detonate a mixture comprising the conditioned fuel, the primary fuel and the primary oxidizer and exhaust a plurality of detonation products; the primary fuel comprises a hydrocarbon fuel. Bussing '018 teaches various aspects of the claimed invention but do not specifically teach pyrolyzing the fuel to precondition the fuel. Cooper et al teach pyrolyzing the fuel via pyrolyzing the fuel in reactor using a heat source and a catalyst to enhance detonatability of the fuel. Russian 2034996C teach it is old and well known to pyrolyze a fuel as well as detonate a primary fuel in a pulse detonation engine. It would have been obvious to one of ordinary skill in the art to pyrolyze the fuel as taught by either Cooper et al or the Russian reference, in order to enhance the detonability of the fuel. As for the use of a plasma source to pyrolyze the fuel, Titus et al teach a plasma fuel pyrolyzer 634 (see face of patent) for pyrolyzing a fuel 636 where the pyrolyzed fuel can be delivered to a combustor and turbine system (see Fig. 1). It would have been obvious to one of

ordinary skill in the art to pyrolyze the fuel using a plasma source, as a well known type of fuel treatment used for fuels that are used in turbine engine systems.

4. Claims 1, 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussing (6,062,018) as applied above, and further in view of the Ma et al paper and Maslin et al (4,287,377) and optionally further in view of Titus et al (5,847,353).

Bussing teaches various aspects of the claimed invention (see above for detailed teachings) but do not teach pyrolyzing the fuel to precondition the fuel. Ma et al teach that prior to detonation, it is known the fuel is pyrolyzed (see page 161, left col., 1<sup>st</sup> paragraph). Maslin et al teach it is old and well known to pyrolyze the fuel (methane) in a reactor via a heat source and/or catalytically (col. 1, lines 4+) prior to combustion in a turbine engine. It would have been obvious to one of ordinary skill in the art to employ a pyrolyzer to pyrolyze the fuel, as such as the pyrolyzed constituents will be those that actually detonate. As for the use of a plasma source to pyrolyze the fuel, Titus et al teach a plasma fuel pyrolyzer 634 (see face of patent) for pyrolyzing a fuel 636 where the pyrolyzed fuel can be delivered to a combustor and turbine system (see Fig. 1). It would have been obvious to one of ordinary skill in the art to pyrolyze the fuel using a plasma source, as a well known type of fuel treatment used for fuels that are used in turbine engine systems.

#### ***Response to Arguments***

5. Applicant's arguments filed 11/14/2005 have been fully considered but they are not persuasive. Applicant arguments concerning the Bussing predetonator are not

persuasive as applicant fails to appreciate the full scope of his teachings. Bussing, as applicant notes, teaches the predetonation tube must be filled with a highly detonable mixture. Using a preconditioner to precondition the fuel and make it more detonable clearly is consistent with this explicit teaching of Bussing. Furthermore, applicant fails to appreciate that the preconditioning taught by the secondary references was not to be interpreted, as by applicant, to be limited to the predetonator fuel. On the contrary, the preconditioning suggested by the secondary references is also applicable to the main detonator fuel.

6. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the prior art teaches that preconditioning the fuel will enhance its detonability and so applicant's arguments are not persuasive.

7. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of

ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, the prior art teaches that preconditioning the fuel will enhance its detonability and extrinsic evidence clearly is set forth to teach nonpatentability.

8. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

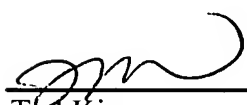
***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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